Summary of projects from shortlisted EuroTeQ Collider teams at CTU participating at the EuroTeQathon.

Challenge - Digital Ear – An automated anomaly detection in brewing machinery

Team name - SenseWise
Challenge Collaborator - Pilsner Urquell (Asahi)
Summary of the project - We are SensWise! We specialize in creating comprehensive IoT solutions for detecting malfunctions in industrial equipment through sound analysis. Our project originated from a request by Plzeňský Prazdroj, a prominent Czech brewery that is part of the Asahi Group. The task was to develop a system capable of listening to the machines in the brewery and detecting any anomalies to alert operators in case of a malfunction. This system needs to be integrated with the brewery's existing infrastructure.
During the Collider program, we developed a prototype consisting of two directional microphones and a processing unit. These modules communicate with a central computer that processes real-time audio signals. Our software solution includes two key components: Unsupervised Sound Analysis and Continuous Learning. The first module analyzes sound without prior knowledge to identify anomalies that indicate potential malfunctions. In the second phase, these detections are categorized by an operator. Based on this labelling, the system continuously learns to adapt to the specific machines of each customer.
Our solution is highly cost-effective. According to our analysis, we can produce sensor units for as low as €24 each. Including the costs of implementing the infrastructure and acquiring the master processing unit, the total expense for a medium-sized industrial operation ranges from €2,500 to €5,500, depending on the amount of equipment monitored. We anticipate detecting malfunctions up to 15% faster, which, in a case study of one of our client's breweries, translates to saving hundreds of hectoliters of beer annually.
Our system's flexibility is outstanding. While it is particularly beneficial for breweries and industrial enterprises, it can also be applied in fields such as science, research, or healthcare—anywhere, constant machine monitoring is essential. Our business plan follows a business-to-business model but also offers opportunities to scale up (business-to-government) or scale down (business-to-customer). The modular nature of our solution makes it an attractive option for small manufacturers with limited equipment, enabling them to monitor their production even in their absence.
We are the perfect choice for you. We provide a fully modular solution tailored to each customer's needs, ensuring affordability and maximum user-friendliness to reduce, not add, to our customers' concerns. We offer comprehensive integration and installation services at the customer's site. Transitioning to our system is seamless, and we continuously improve our solution using anonymized data from other customers. All these factors make us the clear choice for anyone seeking a reliable and efficient solution for monitoring machine infrastructure.

For more Information contact euroteq@cvut.cz